BUREAU OF WATER

South Carolina Department of Health and Environmental Control

# SHELLFISH MANAGEMENT AREA 16A

# 2003 ANNUAL UPDATE

## Shellfish Sanitation Program

Water Monitoring, Assessment and Protection Division
Environmental Quality Control - Bureau of Water
2600 Bull Street
Columbia, South Carolina 29201

**July 2003**

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South Carolina Department of Health and Environmental Control

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# 2003 ANNUAL UPDATE

## [ Data Thru December 2002 ]

# Shellfish Management Area 16A
# Shellfish Sanitation Program


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**SCDHEC EQC Bureau of Water**

**Data Inclusive Dates:**
01/01/00 thru 12/31/02

**Classification Change:**
X Yes ___ No

**Shoreline Survey Completed:** Yes

**(I)ncreased/(D)ecreased/(N)one:**
I Approved
D Cond.
D Restricted
I Prohibited

**Prior Report & Date:** Annual -2002

## SUMMARY

Presently, the water quality classification at stations 23 and 09 in Edding Creek meets the criteria for an Approved classification. The fecal coliform estimated 90th percentile MPN (Most Probable Number) values for these stations are 12 and 27, respectively, well below the maximum value of 43 allowed for an Approved classification. Data collected at stations 23 and 09 is used to classify, and evaluate the Edding Creek Conditional Management Area. Management of this area as Conditionally Approved has been manpower intensive, especially considering the relatively small amount of shellfish resource. Therefore, in order to more efficiently manage time and personnel, the harvesting classification of Edding Creek, between Station 23 and Station 09, will be reclassified as Approved. Water quality at Station 23 appears to be impacted by rainfall, so a return to a normal rainfall pattern may result in a subsequent reclassification to Restricted.

For this review period, water quality at Station 18, Edding Creek at Shrimp Dock, meets the statistical criteria for an Approved classification, with a $90^{th}$ percentile MPN of 26. Geometric Mean and/or Estimated $90^{th}$ percentile MPN values of fecal coliform bacteria in samples collected at Station 18 during the three-year review period are lower than the previous three-year period. This appears to be directly related to the drought conditions the area has experienced over the last four years. The water quality classification at this station has been Restricted since the 1997 Annual Update, however, as water quality at Station 18 will likely exceed Approved area criteria as normal rainfall patterns resume, the harvesting classification at Station 18 will remain Restricted.

Administratively Prohibited closures zones will be implemented around two commercial fishing docks sized such that closures are required in accordance with S.C. R. 61-47. These facilities are located on Edding Creek and Coffin Creek. A third facility, located on Lucy Point Creek, will be evaluated for compliance with S.C. R.61-47.

# INTRODUCTION

## PURPOSE AND SCOPE

The authority to regulate the harvest, sanitation, processing and handling of shellfish is granted to the South Carolina Department of Health and Environmental Control by Section 44-1-140 of the Code of Laws of South Carolina, 1976, as amended. The Department promulgated Regulation 61-47 which provides the rules used to implement this authority and outlines the requirements applied in regulating shellfish sanitation in the State This regulation specifically addresses classification of shellfish harvesting areas and requires that all areas be examined by sanitary and bacteriological surveys and classified into an appropriate shellfish harvesting classification.

The National Shellfish Sanitation Program (NSSP) Guide For The Control Of Molluscan Shellfish is used by the United States Food and Drug Administration (USFDA) to evaluate state shellfish sanitation programs. The NSSP Model Ordinance requires that a sanitary survey be in place for each growing area prior to its use as a source of shellfish for human consumption and prior to the area's classification as Approved, Conditionally Approved, Restricted, or Conditionally Restricted. Each sanitary survey shall be updated on an annual basis and accurately reflect changes which have occurred within the area. Requirement of the annual reevaluation include, at a minimum, field observations of pollution sources, an analysis of water quality data consisting of the past year's data in combination with appropriate previously collected data, review of reports and effluent samples from pollution sources, and review of performance standards for discharges impacting the growing area. A brief report documenting the findings shall also be provided.

The following criteria consistent with the NSSP Model Ordinance and S. C. Regulation 61-47 are used in establishing shellfish harvesting classifications:

Approved - Growing areas shall be classified Approved when the sanitary survey concludes that fecal material, pathogenic microorganisms, and poisonous or deleterious substances are not present in concentrations which would render shellfish unsafe for human consumption. The Approved area classification shall be designated based upon a sanitary survey which includes water samples collected from stations in the designated area adjacent to actual or potential sources of pollution. For waters sampled under adverse pollution conditions, the median fecal coliform Most Probable Number (MPN) or the geometric mean MPN shall not exceed fourteen per one hundred milliliters, and not more than ten percent of the samples shall exceed a fecal coliform MPN of forty-three per one hundred milliliters (per five tube decimal dilution). For waters sampled under a systematic random sampling plan, the geometric mean fecal coliform Most Probable Number (MPN) shall not exceed fourteen per one hundred milliliters, and the estimated ninetieth percentile shall not exceed an MPN of forty three (per five tube decimal dilution). Computation of the estimated ninetieth percentile shall be obtained using NSSP Guidelines.

Conditionally Approved - Growing areas may be classified Conditionally Approved when they are subject to temporary conditions of actual or potential pollution. When such events are predictable, as in the malfunction of wastewater treatment facilities, non-point source pollution from rainfall runoff,

discharge of a major river, or potential discharges from dock or harbor facilities that may affect water quality, a management plan describing conditions under which harvesting will be allowed shall be adopted by the Department prior to classifying an area as Conditionally Approved. Where appropriate, the management plan for each Conditionally Approved area shall include performance standards for sources of controllable pollution, e.g., wastewater treatment and collection systems, evaluation of each source of pollution, and means of rapidly closing and subsequent reopening areas to shellfish harvesting. Memorandums of agreements shall be a part of these management plans where appropriate.

Restricted - Growing areas shall be classified Restricted when sanitary survey data show a limited degree of pollution or the presence of deleterious or poisonous substances to a degree which may cause the water quality to fluctuate unpredictably or at such a frequency that a Conditionally Approved classification is not feasible. Shellfish may be harvested from areas classified as Restricted only for the purposes of relaying or depuration and only by special permit issued by the Department and under Department supervision. For Restricted areas to be utilized as a source of shellstock for depuration, or as source water for depuration, the fecal coliform geometric mean MPN of restricted waters sampled under adverse pollution conditions shall not exceed eighty-eight per one hundred milliliters and not more than ten percent of the samples shall exceed a MPN of two hundred and sixty per one hundred milliliters for a five tube decimal dilution test. For waters sampled under a systematic random sampling plan, the fecal coliform geometric mean MPN shall not exceed eighty-eight per one hundred milliliters and the estimated ninetieth percentile shall not exceed an MPN of two hundred and sixty (five tube decimal dilution). Computation of the estimated ninetieth percentile shall be obtained using NSSP guidelines.

Conditionally Restricted - Growing areas may be classified Conditionally Restricted when they are subject to temporary conditions of actual or potential pollution. When such events are predictable, as in the malfunction of wastewater treatment facilities, non-point source pollution from rainfall runoff, discharge of a major river, or potential discharges from dock or harbor facilities that may affect water quality, a management plan describing conditions under which harvesting will be allowed shall be prepared by the Department prior to classifying an area as Conditionally Restricted. Where appropriate, the management plan for each Conditionally Restricted area shall include performance standards for sources of controllable pollution (e.g., wastewater treatment and collection systems and an evaluation of each source of pollution) and description of the means of rapidly closing and subsequent reopening areas to shellfish harvesting. Memorandums of agreements shall be a part of these management plans where appropriate. Shellfish may be harvested from areas classified as Conditionally Restricted only for the purposes of relaying or depuration and only by permit issued by the Department and under Department supervision. For Conditionally Restricted areas to be utilized as a source of shellstock for depuration, the fecal coliform geometric mean MPN of Conditionally Restricted waters sampled under adverse pollution conditions shall not exceed eighty-eight per one hundred milliliters and not more than ten percent of the samples shall exceed a MPN of two hundred and sixty per one hundred milliliters for a five tube decimal dilution test. For waters sampled under a systematic random sampling plan, the fecal coliform geometric mean MPN shall not exceed eighty-eight per one hundred milliliters and the estimated ninetieth percentile shall not exceed an MPN of two hundred and sixty (five tube decimal dilution). Computation of the estimated ninetieth percentile shall be obtained using NSSP guidelines.

Prohibited - Growing areas are classified Prohibited if there is no current sanitary survey or if the sanitary survey or monitoring data show unsafe levels of fecal material, pathogenic microorganisms, or poisonous or deleterious substances in the growing area or indicate that such substances could potentially reach quantities which could render shellfish unfit or unsafe for human consumption.

**BACKGROUND INFORMATION**

Shellfish Management Area 16A consists of approximately 26,608 acres of shellfish growing area habitat located in Beaufort County. The Area includes the Morgan River and its tributaries including Lucy, Parrot, Jenkins, Edding, Village, and Coffin Creeks.

The area's northern boundary begins at the confluence of Lucy Creek and Coosaw River (Sam's Point) and follows the southern shoreline of Coosaw River and Morgan Island. The eastern boundary is defined by St. Helena Sound and the Atlantic Ocean. The southern boundary begins on the northwest shore of Harbor Island and follows Hwy 21 to Seaside Road (SR-77) and then is defined by an imaginary line extending to Land's End Road (SR-45). The boundary then continues back to Hwy 21. The southern boundary follows Hwy 21 to it's intersection with SC 802, which is the western boundary. The western boundary runs across Lady's Island along the western shore of Lucy Creek ending at Sam's Point.

Area 16A is largely rural, with expansive areas of agricultural land (particularly on St. Helena Island) used for growing tomatoes, cucumbers, and sod. The western boundary on Lady's Island is more surburban in character. Shrimp boat docks are located on Coffin, Edding, and Lucy Point Creeks. A residential development on Dataw Island includes two golf courses and a marina.

The harvesting classifications of Area 16A prior to this survey were as follows:

**Prohibited**: (Administrative closure):
1) Dataw Marina closure zone;

**Restricted**:
1) Rock Springs Creek, from its headwaters to its confluence with Lucy Point Creek;
2) Edding Creek, from its headwaters to station 23
3) Coffin Creek, from its headwaters to its confluence with Morgan River;

**Conditionally Approved**:
1) Edding Creek, between station 9, at the confluence with Morgan River, and Station 23, at the small tributary between stations 9 and 18

**Approved**: The remaining waters of Area 16.

Station Addition/Deactivation/Modification: None

The shellfish industry in South Carolina is based mainly on the harvest of the eastern oyster (Crassostrea virginica) and hard clams (Mercenaria mercenaria). Areas in South Carolina designated for commercial harvest by the South Carolina Department of Natural Resources (SCDNR) are defined as State Shellfish Grounds, Culture Permit areas, Mariculture Permit areas, and Kings Grant areas. There are four shellfish Culture Permit areas in Area 16A. C-114 and C-122 are leased to L.P. Maggioni & Company. C-128 is leased to Charlie Brown Seafood and C-131 is leased to Thomas Backman. There are four Mariculture Permit areas in Area 16A. Three are located adjacent to the Coffin Point State Shellfish Ground (S-127). M-109 is leased to Joel Morris, M-110 is leased to Charles Hall, and M-111 is leased to Joseph Leland. The fourth, M-112, in Jenkins Creek, is leased to Joel Morris.

The general public is allowed to harvest on three SSGs within Area 16. S-065 is located on Morgan Island, S-124 is in Morgan River, and S-127 is at Coffin Point. Recreational harvesting is allowed for clams and oysters in all areas, and commercial harvesting by licensed individuals is allowed, subject to conditions established by SCDNR.

Shellfish harvesting season in South Carolina extends from September 16 through May 15, although actual dates may vary. SCDNR has the authority to alter the shellfish harvesting season for management purposes. The South Carolina Department of Health and Environmental Control has the authority to prohibit shellfish harvesting when necessary to ensure that all shellfish harvested in South Carolina waters are safe for human consumption.

## POLLUTION SOURCE SURVEY

### SURVEY PROCEDURES

Shoreline surveys of Area 16A were conducted by the Low Country District Shellfish Sanitation staff, by watercraft, vehicle, and on foot, during the survey period and are ongoing.

### POINT SOURCE POLLUTION

Major sources of actual or potential pollution (see Figure 4):

| PERMITTED FACILITIES | PERMIT #/TYPE/ DISCHARGE |
|---|---|
| BJW&SA St. Helena WWTP | SC0039811/0.60MGD/spray irrigation |
| Dataw Island Marina | Marina/ with pumpout |
| Edding Creek Commercial Docks | Marina/without pumpout |
| Coffin Creek Commercial Docks | Marina/without pumpout |

A. Municipal and Community Waste Treatment Facilities - New sewer lines have been installed from Lady's Island and along Hwy 21 to the St. Helena WWTP, serving schools and businesses and new subdivisions. Lady's Island Middle School had an aerated lagoon system

with chlorination. Treated effluent was disposed of in a tile field. The discharge from this facility has been eliminated through incorporation into the BJW&SA St. Helena WWTP.

The recently upgraded BJW&SA St. Helena WWTP is an extended aeration type system with gas chlorination. Treated effluent is pumped to Dataw Island where it is spray irrigated on golf courses. A new spray site has been added on a sod farm in Area 16B.

B. Industrial wastes - There are no permitted industrial discharges in Area 16A.

C. Marinas - S.C. Regulation 61-47, Shellfish defines *Marina* as "any water area with a structure (docks, basin, floating docks, etc.) which is: 1) used for docking or otherwise mooring vessels; and, 2) constructed to provide temporary or permanent docking space for more than ten boats, or has more than 200 linear feet of docking space." There is a permitted marina at Dataw Island which has a marine sewage pumpout facility. There are commercial docks located in Edding and Coffin Creeks that meet the current definition of marina. Closures zone sizing for these facilities has recently been calculated. An additional facility, on Lucy Point Creek, will be evaluated in the future.

D. Radionuclides - Sources of radionuclides have not been identified within Area 16A, and radionuclide monitoring has not been conducted. No other sources of poisonous or deleterious substances have been identified within the area.

**NONPOINT SOURCE POLLUTION**

A. Stormwater - Stormwater runoff impacts water quality by transporting fecal coliform bacteria (and other pollutants) from land to the shellfish growing area. Stormwater from roads, residences, and agricultural land is directed to the lowest point of elevation which is often the nearest creek or marsh. In addition, there are freshwater wetland areas, ditches, and impoundments that drain into tidal creeks.

Most land disturbing activities in South Carolina must comply with the Stormwater Management and Sediment Reduction Act of 1991. The final regulations, effective on June 26, 1992, establish the procedures and minimum standards for a statewide stormwater management program. For activities in the eight coastal counties, additional water quality requirements are imposed. For all projects, regardless of size, which are located within one-half mile of a receiving water body in the coastal zone, the criteria for permanent water quality ponds having a permanent pool is that they are designed to store the first 2 inch of runoff from the entire site over a 24 -hour period or storage of the first one inch of runoff from the built-upon portion of the property, whichever is greater. Storage may be accomplished through retention, detention, or infiltration systems, as appropriate for the specific site. In addition, for those projects which are located within 1000 feet of shellfish beds, the first one and one half inches of runoff from the built-upon portion of the property must be retained on site. Since 1992, these regulations have been applied to the development of residential subdivisions, golf courses, and business areas.

B. Agricultural Waste - Small herds of cattle are located near the headwaters of Edding Creek and Coffin Point. Further investigation of these areas will be conducted to document the occurrence of adverse impacts upon shellfish water quality.

C. Individual Sewage Treatment and Disposal (ISTD) Systems - The majority of homes adjacent to Area 16A utilize ISTDs for wastewater disposal.

D. Wildlife and Domestic Animals - This area supports populations of white-tailed deer, raccoons, wading birds, migratory waterfowl, and other wildlife, which may contribute to fecal coliform levels in some areas. Domestic animals present in the area include dogs, cats, horses, and goats.

E. Boat Traffic - The Morgan River provides access to St. Helena Sound and the Atlantic Ocean for shrimp boats and recreational boaters. There are numerous private boat docks throughout Area 16A.

F. Hydrographic and Habitat Modification - Hydrographic and habitat modification in estuarine areas requires both State and Federal approval.

G. Marine Biotoxins - There have been no documented occurrences of toxic algae affecting water quality in Area 16A. The Department participates in a State Task Force on Toxic Algae and maintains a toxic algae emergency response team.

## HYDROGRAPHIC AND METEOROLOGICAL CHARACTERISTICS

### PHYSIOGRAPHY

Area 16A is part of the St. Helena Sound estuary. The estuary is a drowned river valley/bar built system containing numerous marsh islands and tidal creeks. It is among the largest of the South Atlantic estuaries. The average depth of the estuary is approximately 12 feet at mid-tide level. Extensive shallow areas and numerous tidal flats exist within the estuary. The AIWW (12 feet at MLW) is the only maintained navigational channel (NOAA, 1994).

**Tides** - Tides in Area 16A are semidiurnal, consisting of two low and high tides each lunar day. Mean tidal range is 5.9 feet during normal tides and 6.9 feet during spring tides. The greatest tidal ranges of the year typically occur around full moon during the months of September through December. There is considerable variation in the normal tide range due to the prevailing strength and direction of winds.

**Rainfall** - Rainfall data used in this survey is collected at a weather station located at the City of Beaufort WWTP (Station 380559- Beaufort 7 SW). The rainfall gauge is typically read at about 7:00 AM and the rainfall amount is recorded for that date. As most shellfish samples are collected after 7:00 AM, this report's rainfall summary table includes rainfall data for the sample date + 24 hours. Rainfall recorded for the sample date + 24 hours may correlate better and help explain elevated fecal coliform concentrations in sample results, particularly if there was zero rainfall recorded on the morning of, or a

day prior to, sampling. The rainfall summary is included in Table #5.

Annual rainfall recorded at the Beaufort 7SW weather station was significantly below the 30-year normal amount for 2000 and 2001 (see Chart Beaufort Annual Rainfall). Below normal rainfall continued through May 2002 and by August 2002, the drought status of all 46 counties in the state, including Beaufort and Colleton, had been upgraded to extreme. Above normal rainfall beginning in late August, however, led the S.C. Drought Response Committee to downgrade the drought status statewide and remove the drought declaration for Beaufort, Charleston, and Colleton counties on November 21, 2002.

Mean annual rainfall for a 30-year period is 51.15", with August typically being the wettest month. Charts showing yearly rainfall amounts for the years 1997 through 2002 are attached. Approximately 40% of the annual rainfall falls in the three month period from June to August. Weather patterns during this time period are often characterized by thunderstorms and shower activity of a short duration. In addition, these three months also have the highest numbers of days with rainfall greater than 1". The months of December through March historically have the greatest number of days with rainfall exceeding 0.10" and 0.50". Rainfall events during these months are typically of a longer duration.

The effects of El Niño were first experienced as early as March of 1997, in the form of decreased rainfall. Rainfall amounts were below normal until mid-summer when the warm phase El Niño effects were observed in the form of above normal rainfall. The full influence of El Niño with regard to rainfall was observed in the fall, when amounts were recorded in excess of the 30 year average. This warm and wet trend continued through April, 1998. The 102 year (1895-1996) El Niño average rainfall for November to March for this region of S.C. is about 125% of the normal rainfall amount.

**Winds** - The prevailing wind direction between February and September ranges between South and South Southwest (180 to 200 degrees) and between October and January is North Northeast (20 degrees). The annual mean wind speed is 8.5 MPH, with August having the lowest (7.3 MPH) and March the highest (10.0 MPH) mean wind speed.

**River discharges** - The South Edisto River originates in the midlands of South Carolina and flows approximately 140 miles through the piedmont and coastal plain until it enters the Atlantic Ocean at Edisto Beach. It is the St. Helena Sound estuary's major freshwater source. The river discharges at an average rate of 2631 cubic feet per second. The Ashepoo River and Salkahatchie/Combahee Rivers also contribute to freshwater input, but to a lesser degree.

## WATER QUALITY STUDIES

### DESCRIPTION OF THE PROGRAM

The Department currently utilizes a systematic random sampling (SRS) strategy within Area 16A in lieu of sampling under adverse pollution conditions. In order to comply with NSSP guidelines, a

minimum of thirty samples are required to be collected and analyzed from each station during the review period. Sampling dates are computer generated prior to the beginning of each quarterly period thereby insuring random selection with respect to tidal stage and weather. Day of week selection criteria is limited to Mondays, Tuesdays, and Wednesdays due to shipping requirements and laboratory manpower constraints. Sample schedules are rarely altered.

During July, 1998, an updated data analysis procedure was formalized. Samples utilized for classification purposes are limited to those samples collected in accordance with the SRS for a 36 month period beginning January 1 and ending December 31. This allows for a maximum of 36 samples per station yet provides a six sample cushion (above the NSSP required 30 minimum) for broken samples, lab error, breakdowns, etc. This also allows each annual report to meet the NSSP Triennial Review sampling criteria.

Six hundred ten (610) routine surface water quality samples (<1.0 ft. deep) were collected for bacteriological analyses at 17 active water quality sampling stations in Area 16A during the period 01/01/00 through 12/31/02. The samples were collected in 120 ml amber glass bottles, immediately placed on ice and transported by bus to the South Carolina Department of Health and Environmental Control's Trident District Environmental Quality Control laboratory at North Charleston, South Carolina or the Low Country District Environmental Quality Control laboratory at Beaufort, South Carolina. An additional 120 ml water sample was included with each shipment as a temperature control. Upon receipt at the laboratory, sample sets that exceeded a 30-hour holding time or contained a temperature control > 10 degrees C. were discarded. No results were obtained for stations 13A and 19 on 07/12/2000 due to lab error.

Samples collected after September 1, 1986 have been analyzed using the five tube/three dilution modified A-1 method described by Nuefeld (1985). Surface water temperatures were measured utilizing hand-held, laboratory-quality calibrated centigrade thermometers. Salinity measurements were measured in the laboratory using automatic temperature compensated refractometers. Additional field data include ambient air temperature, wind direction, tidal stage and date and time of sampling. Tidal stages were determined Nautical Software's Tides and Currents, Version 2 (1996).

**MONITORING RESULTS**

Stations 08, 09, 10, 11, 13, 13A, 13B, 14, 18, 23, 24, 25, 27, 30, and 32 meet the statistical criteria for Approved classification. Stations 19 and 28 exceeded a fecal coliform MPN geometric mean value of 14 or a fecal coliform MPN estimated 90th percentile value of 43, thus meeting the statistical criteria for a Restricted classification. No station exceeded a fecal coliform MPN geometric mean value of 88 or a fecal coliform MPN estimated 90th percentile value of 260.

Sampling began at Station 32, Village Creek at Fripp Point Community Dock, on 09/01/99. Thirty samples are required for classification purposes. Station 32 has 36 sample results for the review period, and is being classified for the first time. Water quality at Station 32 meets the statistical criteria for an Approved classification.

For the calendar year 2002, analysis of samples collected at stations 9 and 23 in the Edding Creek Conditional Area while in the Open status indicates each station meets the statistical criteria for Approved classification (see data sheets- Conditional Area in Open Status).

## CONCLUSIONS

Based on review of fecal coliform bacteriological data and the pollution source survey, Area 16A is impacted by three sources of actual or potential pollution.

### NONPOINT SOURCE RUNOFF

Stormwater runoff is the major source of fecal coliform bacteria contamination in Area 16A. The impact of rainfall on water quality is greater in tidal creeks such as Coffin and Edding Creeks than in the more open water areas of the Morgan River. Possible sources of fecal coliform bacteria contamination include failing septic systems, pets, domestic animals such as horses and cows, wildlife, and drainage from roads and freshwater wetlands.

Portions of Area 16A receive appreciable freshwater inflow from the Combahee River and St. Helena Sound, particularly in the spring. Abnormally high rainfall during the El Niño event in the spring of 1998 caused a dramatic increase in freshwater inflow and lowering of salinity in the St. Helena Sound estuary. This low salinity water was transported throughout Area 16A by tidal exchange.

### INDIVIDUAL SEWAGE TREATMENT AND DISPOSAL SYSTEM.

Almost all homes adjacent to shellfish waters in Area 16A are served by ISTDs. Soils in most areas are considered to be suitable for ISTDs and systems should operate properly if maintained. However, many older homes with existing systems may not meet current standards.

## RECOMMENDATIONS

Presently, the water quality classification at stations 23 and 09 in Edding Creek meets the criteria for an Approved classification. The fecal coliform estimated 90th percentile MPN (Most Probable Number) values for these stations are 12 and 27, respectively, well below the maximum value allowed (43) for an Approved classification. Data collected at stations 23 and 09 are used to classify, and evaluate the Edding Creek Conditional Management Area. Management of this area as Conditionally Approved has been manpower intensive, especially considering the harvesting opportunities associated with such a relatively small amount of shellfish resource. Therefore, in order to more efficiently manage time and personnel, the harvesting classification of Edding Creek will be temporarily upgraded to Approved. Water quality at Station 23 appears to be impacted by rainfall and the resumption of normal rainfall may result in a future classification downgrade.

For this review period, water quality at Station 18, Edding Creek at Shrimp Dock, meets the statistical criteria for an Approved classification, with a 90th percentile MPN of 26. Geometric Mean and/or Estimated 90th percentile MPN values of fecal coliform bacteria in samples collected at Station 18 during the three-year review period are lower than the previous three-year period. This appears to be directly related to the drought conditions the area has experienced over the last four years. The water quality classification at this station has been Restricted since the 1997 Annual Update, however, as water quality at Station 18 will likely exceed Approved area criteria as normal rainfall patterns resume, the harvesting classification at Station 18 should remain Restricted. An administratively Prohibited closure zone should be established around the Edding Creek (Rose Island) commercial dock facility.

Station 28, in Coffin Creek, meets the statistical criteria for a Restricted classification. The Restricted area should remain as indicated in the previous survey; between the headwaters and the Station 27, at the confluence with Morgan River. An administratively Prohibited closure zone should be established around the Coffin Creek commercial dock facility

Station 19 in Rock Springs Creek also meets the statistical criteria for a Restricted classification. The Restricted area, as in the previous survey, should extend to the next Approved station, Station 13 - Lucy Point Creek at Rock Springs Creek.

The shoreline survey and bacteriological data review of shellfish Management Area 16A indicates that changes in classification boundary descriptions are appropriate.
The growing waters classification of Area 16A will be (see Figure 3):

**Prohibited:** (Administrative closure)

1) Dataw Marina closure zone.
2) Edding Creek commercial docks;
2) Coffin Creek commercial docks.

**Restricted:**

1) Rock Springs Creek, from its headwaters to its confluence with Lucy Point Creek;
2) Edding Creek, from its headwaters to Station 23, excluding the Prohibited closure around the Edding Creek commercial dock;
3) Coffin Creek, from its headwaters to its confluence with Morgan River, excluding the Prohibited closure around the Coffin Creek commercial dock.

**Conditionally Approved:** None

**Approved:** The remaining waters of Area 16.

**Station Addition/Deactivation/Modification:** None

Analysis of sampling data for Area 16A demonstrates the probability of a significant impact from rainfall exceeding 4.00" in a 24 hour period. Therefore, a precautionary closure of area 16A will

be implemented following rainfall events of greater than 4.00" in a 24 hour period, as measured at the Beaufort-7-SW Weather Station. This methodology is associated with the concept of the Probable Maximum Precipitation (PMP). PMP estimates for the coastal United States has been published in a series of hydro-meteorological reports (HMRs) by the National Weather Service (National Weather Service). PMP estimates for South Carolina's growing areas are derived from HMRs 51, 52, and 53 (National Research Council, 1985).

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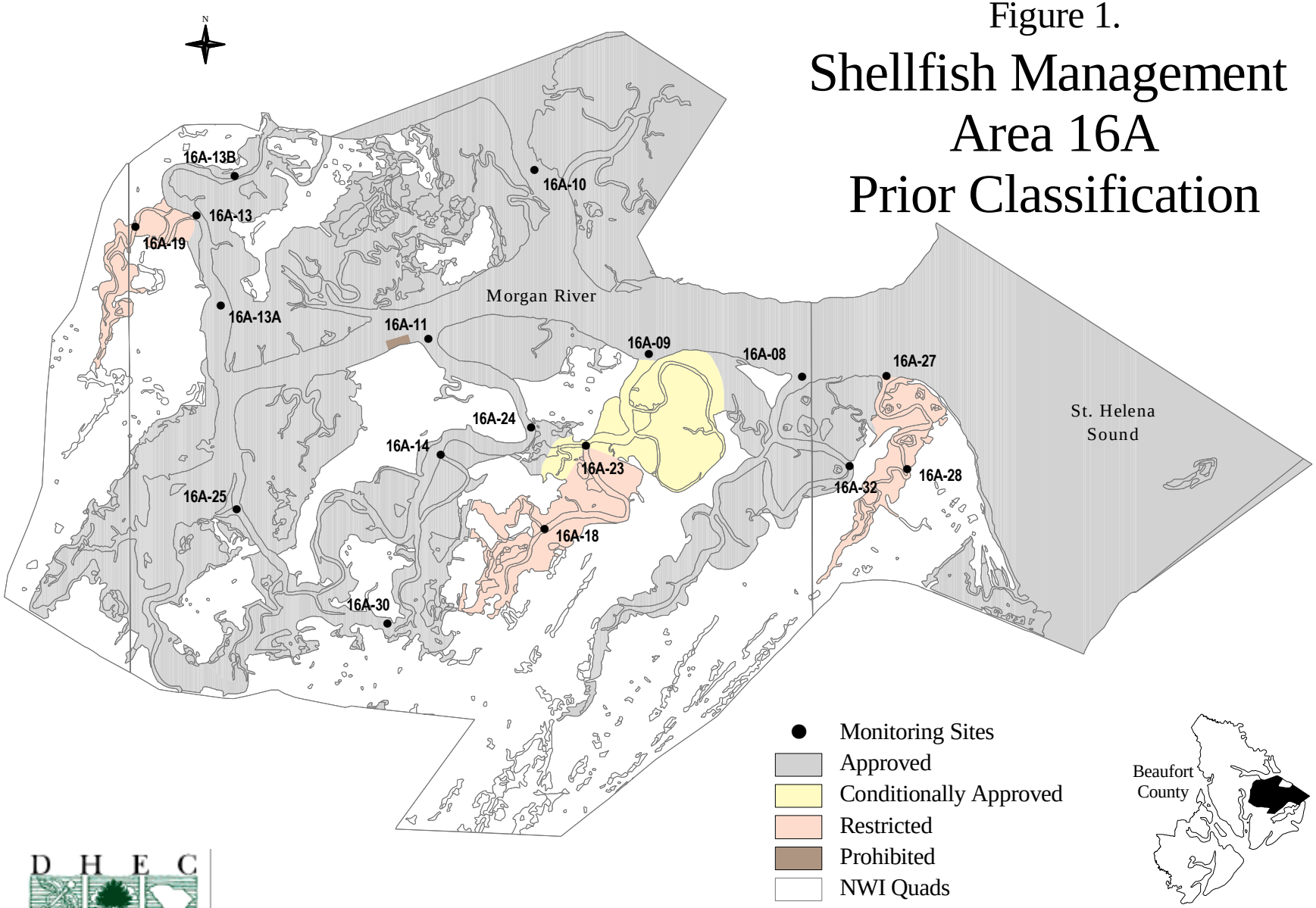
**TABLE #1**
**Shellfish Management Area 16A**
**WATER QUALITY SAMPLING STATIONS DESCRIPTION**

| Station | Description |
|---|---|
| 08 | Morgan River at Village Creek |
| 09 | Edding Creek at Morgan River |
| 10 | Parrot Creek at Morgan River |
| 11 | Jenkins Creek at Morgan River |
| 13 | Lucy Point Creek at Rocky Springs Creek |
| 13a | South Edge of Lucy Point Creek CSZ at Pollution Line |
| 13b | North Edge of Lucy Point Creek CSZ at Pollution Line |
| 14 | Doe Creek Behind Coastal Seafood - Behind Dataw Island |
| 18 | Edding Creek at Shrimp Dock |
| 19 | Upper Reaches Rock Springs Creek |
| 23 | Edding Creek at Small Tributary Between Stations 9 and 18 |
| 24 | Jenkins Creek at Right Turn Between Stations 11 and 14 |
| 25 | Jenkins Creek at Small Unnamed Tributary North Side of Warsaw Island |
| 27 | Mouth of Coffin Creek at Morgan River |
| 28 | Headwaters of Coffin Creek at Shrimp Docks |
| 30 | 500 ft. North of Stormwater at Dataw Island Golf Course, Jenkins Creek |
| 32 | Village Creek at Fripp Point Community Dock |

(Total 17)

Figure 1.

# Shellfish Management Area 16A Prior Classification




D H E C

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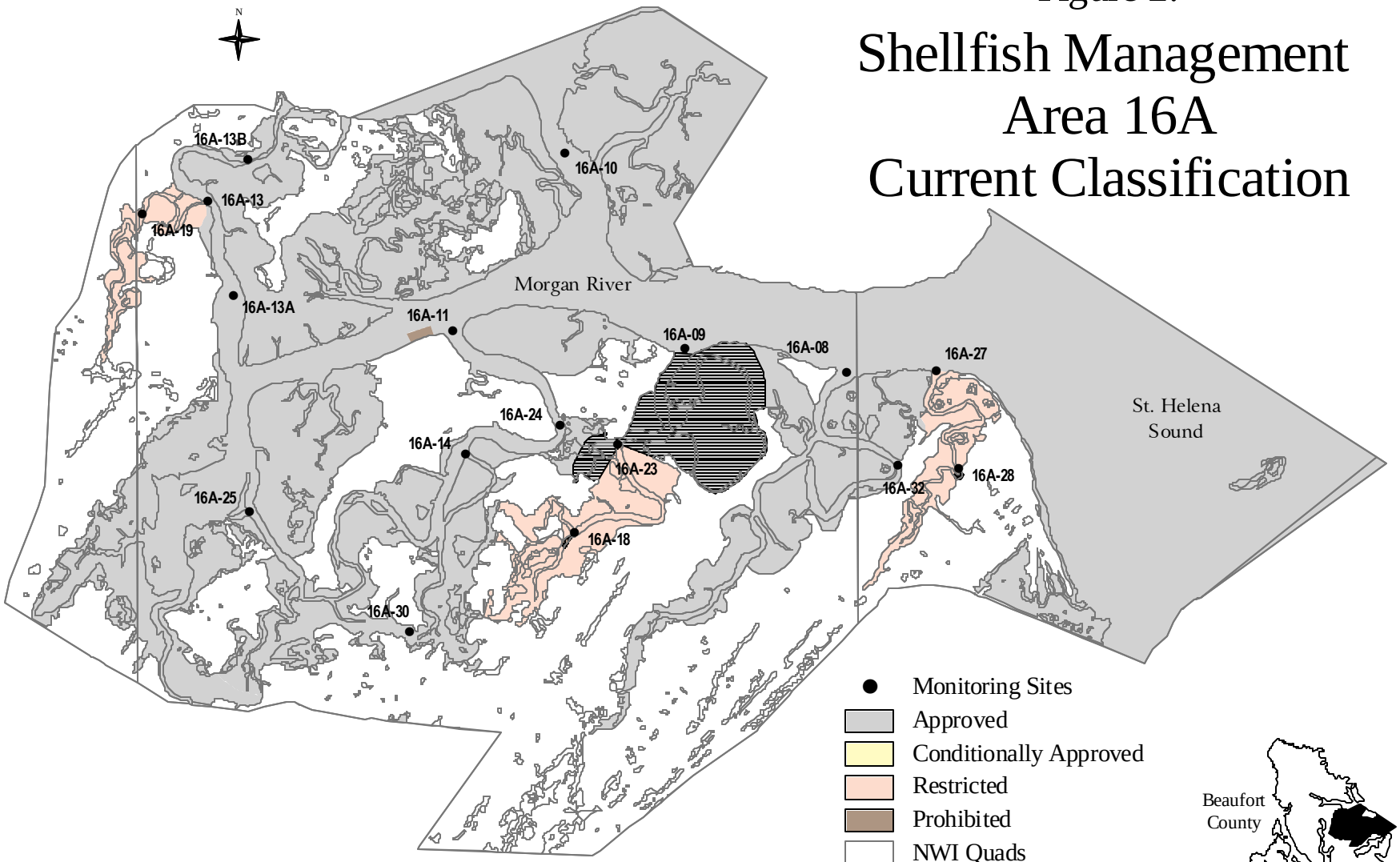
South Carolina Department of Health and Environmental Control

Figure 2.

# Shellfish Management Area 16A Current Classification

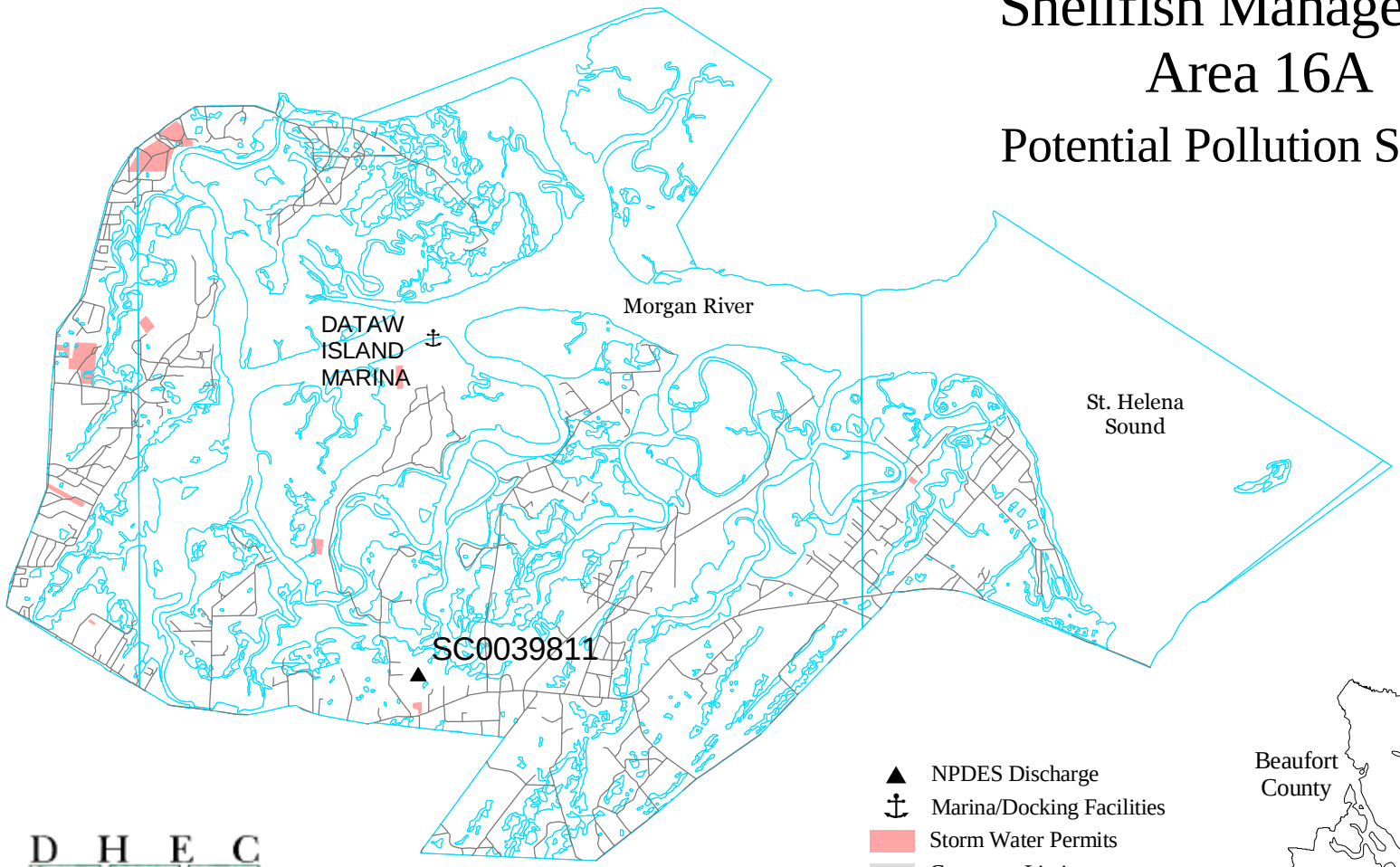



2003 Annual Report

# Figure 3.

# Shellfish Management Area 16A

## Potential Pollution Sources




D H E C

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South Carolina Department of Health and Environmental Control

**TABLE #2**
**Shellfish Management Area 16A**

**FECAL COLIFORM BACTERIOLOGICAL DATA SUMMARY**
**from Shellfish Water Quality Sampling Stations between**

**January 1, 2000 and December 31, 2002**

| STATION # | 08 | 09 | 10 | 11 | 13 | 13A | 13B | 14 | 18 | 19 | 23 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLES | 36 | 36 | 36 | 36 | 36 | 35 | 36 | 36 | 36 | 35 | 36 |
| GEOMEAN | 4.8 | 4.1 | 2.5 | 3.2 | 7.7 | 4.9 | 5.4 | 4.5 | 6.9 | 16.8 | 6.4 |
| 90TH %ILE | 20 | 12 | 5 | 7 | 32 | 18 | 17 | 14 | 26 | 91 | 27 |
| WATER QLTY | A | A | A | A | A | A | A | A | A | R | A |
| CLASSIFICATION | A | A | A | A | R | A | A | A | R | R | R |

| STATION# | 24 | 25 | 27 | 28 | 30 | 32 | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| SAMPLES | 36 | 36 | 36 | 36 | 36 | 36 | | | | |
| GEOMEAN | 4.0 | 4.9 | 5.3 | 13.0 | 3.9 | 5.5 | | | | |
| 90TH %ILE | 10 | 17 | 22 | 76 | 9 | 18 | | | | |
| WATER QLTY | A | A | A | R | A | A | | | | |
| CLASSIFICATION | A | A | R | R | A | A | | | | |

A - Approved CA - Conditionally Approved R - Restricted
RND - Restricted/No Depuration P - Prohibited

**Table 3**

**SPECIAL DATA SETS**
**Shellfish Management Area 16A**

**FECAL COLIFORM BACTERIOLOGICAL DATA SUMMARY**
**From Conditional Management Area Stations**

**Collected While In The Open Status**

**BETWEEN: January 1, 2002 and December 31, 2002**

| STATION #º | 09 | 23 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SAMPLES | 5 | 5 | | | | | | | |
| GEOMEAN | 5.3 | 7.6 | | | | | | | |
| 90TH %ILE | 17 | 26 | | | | | | | |
| WATER QLTY | A | A | | | | | | | |
| CLASSIFICATION | CA | CA | | | | | | | |

A - Approved CA - Conditionally Approved R - Restricted
RND - Restricted/No Depuration P - Prohibited

**TABLE #4**

# Water Quality
# Sampling Stations Data

**Shellfish Management Area 16A**

# BACTERIOLOGICAL DATA

Data for each shellfish station listed in this report's "Fecal Coliform Bacteriological Data Summary Table" and in other shellfish reports, can be obtained through South Carolina's Department of Health and Environmental Control - Freedom of Information office at the address below.

Freedom of Information
2600 Bull Street
Columbia, SC 29201

Any explanation or clarity needed on the report's content can be obtained by contacting the preparer(s), and/or reviewer(s) listed on the cover page.

**TABLE #5**

# Rainfall Data

**Shellfish Management Area 16A**

**Shellfish Management Area 16A**

**A SUMMARY OF RAINFALL**

**During and Prior To Fecal Coliform Sampling**

| Sample Date | Sample Date + 24 hours | Sample Date | Sample Date - 24 hours | Sample Date - 48 hours | Sample Date - 72 hours |
|---|---|---|---|---|---|
| 01/12/00 | 0.00" | 0.00" | 0.38" | 0.01" | 0.00" |
| 02/22/00 | 0.00" | 0.00" | 0.00" | 0.03" | 0.00" |
| 03/13/00 | 0.00" | 0.00" | 0.00" | 0.00" | 0.00" |
| 04/17/00 | 0.00" | 0.00" | 0.00" | 1.03" | 0.11" |
| 05/02/00 | 0.00" | 0.00" | 0.00" | 0.46" | 0.00" |
| 06/12/00 | 0.00" | 0.00" | 0.00" | 0.00" | 0.00" |
| 07/12/00 | 0.03" | 0.50" | 0.00" | 0.00" | 0.00" |
| 08/09/00 | 0.00" | 0.00" | 0.00" | 0.00" | 0.00" |
| 09/20/00 | 0.23" | 0.00" | 0.18" | 0.83" | 0.00" |
| 10/10/00 | 0.00" | 0.00" | 0.00" | 0.00" | 0.00" |
| 11/29/00 | 0.00" | 0.00" | 0.00" | 0.00" | 0.20" |
| 12/04/00 | 0.00" | 0.00" | 0.07" | 0.00" | 0.00" |
| 01/22/01 | 0.00" | 0.00" | 0.00" | 0.45" | 0.00" |
| 02/05/01 | 0.00" | 0.08" | 0.18" | 0.00" | 0.00" |
| 03/19/01 | 1.05" | 0.00" | 0.00" | 0.00" | 0.80" |
| 04/25/01 | 0.27" | 0.00" | 0.00" | 0.00" | 0.00" |
| 05/02/01 | 0.00" | 0.00" | 0.00" | 0.00" | 0.00" |
| 06/18/01 | no data | no data | no data | no data | 0.20" |
| 07/10/01 | 0.00" | 0.00" | 0.00" | 0.00" | 0.00" |
| 08/20/01 | 0.45" | 2.30" | 2.37" | 0.00" | 0.00" |
| 09/12/01 | 0.00" | 0.05" | 0.00" | 0.05" | 0.02" |
| 10/08/01 | 0.00" | 0.00" | 0.25" | 0.00" | 0.00" |
| 11/13/01 | 0.00" | 0.00" | 0.00" | no data | no data |
| 12/19/01 | 0.00" | 0.00" | 0.07" | 0.00" | no data |
| 01/07/02 | 0.00" | 0.00 | no data | no data | 0.08 |
| 02/25/02 | 0.00 | 0.00 | 0.04 | 0.01 | 0.00 |
| 03/05/02 | 0.00 | 0.00 | 0.05 | no data | no data |
| 04/08/02 | 0.02 | 0.00 | 0.00 | no data | 0.00 |
| 05/14/02 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 |
| 06/11/02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 07/15/02 | 0.00 | 0.00 | 0.6 | no data | 2.16 |
| 08/05/02 | 0.00 | no data | 0.02 | no data | 0.02 |
| 09/10/02 | 0.00 | no data | 0.00 | 0.00 | 0.00 |
| 10/07/02 | 0.02 | 0.00 | no data | no data | no data |
| 11/12/02 | 0.89 | 1.2 | 0.00 | 1.12 | 0.00 |
| 12/04/02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |

Amounts shown are per Day, not cumulative / Station 380559 - Beaufort 7 - SW

# ANNUAL TABLE OF DAILY RAINFALL DATA

***SOURCE: City of Beaufort Wastewater Treatment Plant***

***Beaufort, SC (Station #380559 / 7-SW)***

| 2000 | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1st | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 2nd | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.12 | 0.00 | 0.00 | 0.00 |
| 3rd | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.25 | 0.00 | 0.00 | 0.07 |
| 4th | 0.00 | 0.00 | 1.45 | 0.00 | 0.00 | 0.00 | 0.00 | 1.72 | 1.72 | 0.00 | 0.00 | 0.00 |
| 5th | 0.16 | 0.00 | 0.12 | 0.00 | 0.00 | 0.47 | 0.00 | 0.53 | 0.37 | 0.05 | 0.16 | 0.00 |
| 6th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 | 0.00 | 3.52 | 0.01 | 0.00 | 0.00 |
| 7th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 |
| 8th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 |
| 9th | 0.00 | 0.00 | 0.00 | 0.27 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 10th | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.93 |
| 11th | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.07 |
| 12th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.50 | 0.17 | 0.00 | 0.00 | 0.00 | 0.01 |
| 13th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 |
| 14th | 0.00 | 0.60 | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 |
| 15th | 0.00 | 0.87 | 0.00 | 1.03 | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 16th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 |
| 17th | 0.00 | 0.00 | 1.13 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.15 | 0.00 |
| 18th | 0.01 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.83 | 0.00 | 0.00 | 0.00 |
| 19th | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.33 | 0.00 | 0.41 | 0.18 | 0.00 | 0.39 | 0.00 |
| 20th | 0.17 | 0.03 | 1.51 | 0.00 | 0.00 | 0.36 | 0.00 | 0.00 | 0.00 | 0.00 | 0.70 | 0.09 |
| 21st | 0.00 | 0.00 | 0.16 | 0.00 | 0.00 | 0.06 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.00 |
| 22nd | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 23rd | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.60 | 0.00 | 0.00 | 0.00 |
| 24th | 0.29 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.30 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 25th | 0.72 | 0.00 | 0.00 | 0.61 | 0.00 | 0.00 | 1.37 | 0.00 | 0.00 | 0.00 | 0.67 | 0.00 |
| 26th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.20 | 0.00 |
| 27th | 0.00 | 0.00 | 0.00 | 0.00 | 0.38 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 28th | 0.00 | 0.21 | 0.15 | 0.23 | 0.00 | 0.45 | 0.13 | 3.00 | 0.00 | 0.00 | 0.00 | 0.06 |
| 29th | 0.74 | 0.00 | 0.00 | 0.00 | 0.00 | 0.40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 1.44 |
| 30th | 0.41 | | 0.00 | 0.46 | 0.00 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 31st | 0.34 | | 0.38 | | 0.00 | | 0.63 | 0.00 | | 0.00 | | 0.00 |

**(Monthly Figures)** **Year's Rainfall Total: 37.82**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUM | 3.40 | 1.71 | 4.90 | 2.71 | 0.38 | 2.45 | 3.49 | 5.86 | 7.85 | 0.06 | 2.31 | 2.70 |
| MAX | 0.74 | 0.87 | 1.51 | 1.03 | 0.38 | 0.47 | 1.37 | 3.00 | 3.52 | 0.05 | 0.70 | 1.44 |
| MIN | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| AVG | 0.11 | 0.06 | 0.16 | 0.09 | 0.01 | 0.08 | 0.11 | 0.19 | 0.26 | 0.00 | 0.08 | 0.09 |

Note:"--" denotes missing data

(Shellfish Management Areas 14, 15, 16A, 16B, 17, 18, 19)

# ANNUAL TABLE OF DAILY RAINFALL DATA

***SOURCE: City of Beaufort Wastewater Treatment Plant***

***Beaufort, SC (Station #380559 / 7-SW)***

| 2001 | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1st | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.00 | 0.00 | -- | 0.00 | 0.00 | 0.00 |
| 2nd | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.04 | 0.00 | -- | 0.00 | 0.00 | 0.00 |
| 3rd | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | -- | 0.02 | 0.00 | -- | 0.00 | 0.00 | 0.00 |
| 4th | 0.00 | 0.18 | 0.85 | 0.04 | 0.00 | 0.41 | 0.42 | 0.00 | 0.75 | 0.00 | 0.00 | 0.00 |
| 5th | 0.00 | 0.08 | 0.02 | 0.00 | 0.00 | -- | 0.59 | 0.01 | 1.30 | 0.00 | 0.00 | 0.00 |
| 6th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.00 | 0.10 | 0.13 | 0.00 | 0.00 | 0.00 |
| 7th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.00 | 0.00 | 0.23 | 0.25 | 0.00 | 0.00 |
| 8th | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.29 | 0.00 | 0.00 | 0.23 | 0.00 | 0.00 | 0.00 |
| 9th | 0.31 | 0.00 | 0.00 | 0.00 | 0.00 | 0.24 | 0.00 | 0.00 | 0.02 | 0.00 | 0.00 | 0.48 |
| 10th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | 0.02 | 0.05 | 0.00 | -- | 0.00 |
| 11th | 0.00 | 0.06 | 0.00 | 0.00 | 0.00 | 0.05 | 0.00 | -- | 0.00 | 0.00 | -- | 0.63 |
| 12th | 0.10 | 0.70 | 0.00 | 0.00 | 0.00 | 1.30 | 0.00 | 0.00 | 0.05 | 0.02 | 0.00 | 0.06 |
| 13th | 0.09 | 0.06 | 0.77 | 0.00 | 0.00 | -- | 1.06 | 1.58 | 0.00 | -- | 0.00 | 0.00 |
| 14th | 0.00 | 0.02 | 0.00 | 0.20 | 0.00 | 0.20 | 0.28 | 0.66 | 0.00 | -- | 0.00 | 0.00 |
| 15th | 0.00 | 0.00 | 0.15 | 0.00 | 0.00 | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 16th | 0.00 | 0.00 | 0.80 | 0.20 | 0.00 | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 17th | 0.00 | 0.11 | 0.00 | 0.00 | 0.00 | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.00 |
| 18th | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | 0.04 | 0.00 | 2.37 | 0.00 | 0.00 | -- | 0.07 |
| 19th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.00 | 2.30 | 0.00 | 0.00 | 0.00 | 0.00 |
| 20th | 0.45 | 0.00 | 1.05 | 0.00 | 0.00 | 0.22 | 0.00 | 0.45 | 0.00 | -- | 0.00 | 0.00 |
| 21st | 0.00 | 0.00 | 0.51 | 0.00 | 0.00 | 0.11 | -- | 1.02 | 0.00 | -- | 0.00 | 0.00 |
| 22nd | 0.00 | 0.03 | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.00 | -- | 0.00 | 0.00 | 0.00 |
| 23rd | 0.00 | 0.35 | 0.00 | 0.00 | 0.05 | 0.04 | 0.03 | 0.00 | -- | 0.00 | -- | 0.00 |
| 24th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.05 | 1.00 | 0.00 | 0.04 | 0.00 | 0.00 | 0.02 |
| 25th | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | -- | 1.10 | 0.00 | 0.90 | 0.00 | 0.03 | 0.00 |
| 26th | 0.00 | 0.06 | 0.00 | 0.27 | 0.00 | 0.28 | 0.03 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 |
| 27th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.28 | 0.08 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 28th | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.01 | -- | 0.00 | 0.00 | -- | -- | 0.00 |
| 29th | 0.00 | | 0.21 | 0.00 | 0.00 | | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 30th | 0.00 | | 0.95 | 0.00 | 0.40 | | 0.00 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 |
| 31st | 0.80 | | 0.03 | | 0.00 | | 0.00 | | | 0.00 | | 0.00 |

**(Monthly Figures)** **Year's Rainfall Total: 32.02**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUM | 1.80 | 1.66 | 5.38 | 0.71 | 0.45 | 3.57 | 4.65 | 8.53 | 3.71 | 0.27 | 0.03 | 1.26 |
| MAX | 0.80 | 0.70 | 1.05 | 0.27 | 0.40 | 1.30 | 1.10 | 2.37 | 1.30 | 0.25 | 0.03 | 0.63 |
| MIN | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| AVG | 0.06 | 0.06 | 0.17 | 0.02 | 0.01 | 0.22 | 0.17 | 0.29 | 0.15 | 0.01 | 0.00 | 0.04 |

Note:"--" denotes missing data

(Shellfish Management Areas 14, 15, 16A, 16B, 17, 18, 19)

# ANNUAL TABLE OF DAILY RAINFALL DATA

***SOURCE: City of Beaufort Wastewater Treatment Plant***

***Beaufort, SC (Station #380559 / 7-SW)***

| 2002 | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP | OCT | NOV | DEC |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1st | 0.00 | 0.00 | 0.00 | 2.60 | 0.00 | 0.00 | -- | 0.81 | 0.65 | 0.05 | 0.00 | 0.00 |
| 2nd | 0.10 | 0.00 | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | 0.06 | 0.15 | 0.00 | 0.00 |
| 3rd | 0.50 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.16 | 0.00 | 0.00 | 0.00 |
| 4th | 0.08 | 0.00 | 0.05 | 0.00 | -- | 0.00 | 0.00 | 0.02 | 0.00 | -- | 0.00 | 0.00 |
| 5th | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.00 | -- | 0.25 | 0.00 |
| 6th | -- | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.01 | 0.00 | 0.00 | 0.00 | 0.78 | 0.13 |
| 7th | 0.00 | 1.01 | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.49 | 0.00 | 0.02 | 0.04 | -- |
| 8th | 0.00 | 0.25 | 0.00 | 0.02 | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 9th | 0.00 | 0.00 | 0.00 | 0.07 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- |
| 10th | 0.00 | 0.27 | 0.00 | 0.41 | 0.00 | 0.00 | 0.28 | 0.00 | -- | 1.85 | 1.12 | 0.73 |
| 11th | 0.00 | 0.15 | 0.00 | 0.04 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | 0.00 | 0.35 |
| 12th | 0.00 | 0.00 | 0.00 | -- | 0.00 | 0.00 | 2.16 | 0.00 | 0.00 | 0.04 | 1.20 | 0.04 |
| 13th | -- | 0.00 | 0.35 | 0.00 | 0.00 | 0.00 | -- | 0.00 | -- | 0.04 | 0.89 | 0.56 |
| 14th | 0.00 | 0.00 | 0.00 | 0.00 | 0.11 | 0.00 | 0.60 | 0.07 | 0.90 | 0.05 | 0.00 | 0.03 |
| 15th | 0.40 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.56 | 0.02 | 0.00 | 0.00 |
| 16th | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 17th | 0.00 | -- | -- | 0.00 | 0.00 | -- | 0.00 | -- | 0.00 | 0.00 | 1.59 | 0.00 |
| 18th | 0.00 | 0.00 | 0.03 | 0.00 | 0.00 | 0.02 | 0.00 | 0.25 | 0.22 | 0.00 | 0.03 | 0.00 |
| 19th | -- | 0.00 | 0.00 | 0.00 | 1.10 | 0.63 | 0.00 | 0.02 | 0.16 | 0.00 | 0.00 | 0.04 |
| 20th | -- | 0.00 | 0.00 | 0.00 | 0.00 | 3.85 | -- | 0.00 | 0.11 | 0.00 | 0.00 | 0.20 |
| 21st | 0.00 | 0.21 | 0.18 | 0.00 | 0.00 | 1.21 | 1.97 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 22nd | 0.10 | 0.00 | 0.20 | 0.00 | -- | 0.01 | 0.00 | 0.00 | 0.58 | 0.00 | 0.09 | 0.00 |
| 23rd | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 | 0.76 | 0.85 | 0.00 | 1.20 | 0.00 | 0.00 | 0.00 |
| 24th | 0.00 | 0.04 | -- | 0.00 | 0.00 | 0.92 | 0.01 | 0.04 | 0.00 | 0.09 | 0.00 | 0.08 |
| 25th | 0.01 | 0.00 | 0.00 | 0.00 | -- | 0.78 | 0.60 | 0.84 | 0.84 | 0.09 | 0.00 | 1.33 |
| 26th | 0.14 | 0.00 | 0.00 | -- | 0.00 | 0.01 | 0.00 | 0.30 | 0.51 | 0.00 | 0.00 | 0.00 |
| 27th | 0.00 | 0.00 | 0.48 | -- | 0.00 | 0.00 | 0.00 | -- | -- | 0.00 | 0.00 | 0.00 |
| 28th | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | -- | -- | 0.49 | 0.00 | 0.00 |
| 29th | 0.00 | | 0.00 | 0.00 | 0.00 | | 0.00 | 2.23 | 2.05 | 0.38 | 0.00 | 0.00 |
| 30th | 0.00 | | 0.00 | | 0.00 | | 0.00 | 1.50 | | 0.00 | 0.00 | 0.00 |
| 31st | 0.00 | | -- | | 0.00 | | 0.00 | | | | | 0.00 |

**(Monthly Figures)** **Year's Rainfall Total: 50.97**

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SUM | 1.34 | 1.96 | 1.29 | 3.14 | 1.21 | 8.19 | 6.48 | 6.59 | 8.00 | 3.27 | 5.99 | 3.51 |
| MAX | 0.50 | 1.01 | 0.48 | 2.60 | 1.10 | 3.85 | 2.16 | 2.23 | 2.05 | 1.85 | 1.59 | 1.33 |
| MIN | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| AVG | 0.05 | 0.08 | 0.05 | 0.12 | 0.04 | 0.30 | 0.24 | 0.26 | 0.32 | 0.12 | 0.20 | 0.13 |

Note:"--" denotes missing data

(Shellfish Management Areas 14, 15, 16A, 16B, 17, 18, 19)

# Conditional Areas Management Plan - Evaluation

**Shellfish Management Area 16A**

Shellfish Management Area 16A

# EVALUATION OF EDDING CREEK CONDITIONAL AREA MANAGEMENT PLAN July, 2003

## I. BACKGROUND INFORMATION

The following is a description of the Edding Creek Conditionally Approved areas as indicated in the July, 2002 Annual Update:

> *Edding Creek, between Station 9, at the confluence with Morgan River, and Station 23, at the small tributary between stations 9 and 18.*

Stations 09 and 23 are the sole stations located within the Edding Creek Conditional Management Area. The Edding Creek area was first classified as Conditionally Approved in the 2001 Annual Update. There are no mariculture operations in the area, therefore year round harvesting does not occur. The area=s harvesting status is currently undesignated (not a State Shellfish Ground, Culture Permit, or Public Shellfish Ground). Until SCDNR assigns a harvesting designation to the area, only recreational harvesting is permitted.

In the 2003 Annual Update, the water quality classification at stations 23 and 09 in Edding Creek meets the criteria for an Approved classification. The fecal coliform estimated 90th percentile MPN (Most Probable Number) values for these stations are 12 and 27, respectively, well below the maximum value allowed (43) for an Approved classification. Data collected at stations 23 and 09 is used to classify, and evaluate the Edding Creek Conditional Management Area. Management of this area as Conditionally Approved has been manpower intensive, especially considering the relatively small shellfish resource. Therefore, in order to more efficiently manage time and personnel, the harvesting classification of Edding Creek will be upgraded to Approved.

Water quality at Station 23 appears to be impacted by rainfall, so a return to a normal rainfall pattern will likely result in statistical water quality oscillating downwards.

The current evaluation period is calendar year 2002. Closure of the Conditionally Approved area is based on rainfall of 1.00" or greater in a 24-hour period. Rainfall is measured at the BJW&SA Southside WWTP (Station 380559- Beaufort 7-SW).

There are no mariculture activities in this area, therefore, no year-round harvesting takes place.

## II. REEVALUATION OF CONDITIONAL CLASSIFICATION

During the shellfish harvest season, there were nine rainfall events greater than or equal to 1.00":

| Date | Event | Press Release | Sample Date | Reopening Date |
|---|---|---|---|---|
| | | | | |
| *2-7-02 | STATEWIDE CLOSURE CONDITIONAL AREAS, BEAUFORT RAIN 1.01" | 2-7-02 | | |
| | Opened Cond. Areas (15, 16A) | 2-22-02 | 2-20-02 | 2-22-02 |
| 4-1-02 | Closed Area- Rainfall (2.60") | 4-1-02 | | |
| | Opened Area | 4-15-02 | 4-10-02 | 4-15-02 |
| 5-19-01 | Closed Area- (Rainfall 1.10") | 5-20-02 | | |
| | Closed thru end of Harvest season | | | |
| 9-23-02 | Closed Area- Rainfall (1.20") | 9-23-02 | | |
| 9-30-02 | Closure extended- Rainfall (2.05") | | | |
| | Opened Area | 10-10-02 | 9-7,9-02 | 10-10-02 |
| 10-11-02 | Statewide closure- Tropical Storm Advisory, Beaufort rain 1.85" | | | |
| | Opened Area | 10-25-02 | 10-21-02 | 10-26-02 |
| 11-11-02 | Closed Area- Rainfall (1.12") | 10-11-02 | | |
| 11-17-02 | Closure extended –Rainfall (1.59") | | | |
| | Opened Area | 12-9-02 | 12-4-02 | 12-9-02 |
| 12-25-02 | Closed Area- Rainfall (1.33") | 12-27-02 | | |
| | Opened Area | 1-8-03 | 1-6-03 | 1-8-03 |
| | | | | |

**Compliance –** For the evaluation period, compliance with the Edding Creek Conditional Management Area plan was satisfactory.

**Cooperation -** Cooperation by City of Beaufort WWTP personnel in reporting rainfall events has been excellent. WWTP personnel readily supply necessary rainfall data.

**Evaluation of Water Quality with Respect to the Bacteriological Standards** -For the Annual Update review period (January 1, 2000 through December 31, 2002) for Shellfish Management Area 16A, water quality at Stations 09 and 23 in Edding Creek met the statistical criteria for an Approved classification Approved Areas Rainfall Correlation) For the calendar year 2002, analysis of samples collected at Stations 09 and 23 in the Edding Creek Conditional Area while in the Open status indicates the station meets the statistical criteria for Approved classification (see data sheet- Conditional Area in Open Status).

## III. RECOMMENDATIONS

The Edding Creek Conditional Management Area will be eliminated in the 2003 Annual Update.

**SPECIAL DATA SET**
**Shellfish Management Area 16A**

**FECAL COLIFORM BACTERIOLOGICAL DATA SUMMARY**
**From Conditional Management Area Stations**
**Collected While In The Open Status**

**BETWEEN: January 1, 2002 and December 31, 2002**

| STATION # | 09 | 23 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| SAMPLES | 5 | 5 | | | | | | | |
| GEOMEAN | 5.3 | 7.6 | | | | | | | |
| 90TH %ILE | 17 | 26 | | | | | | | |
| WATER QLTY | A | A | | | | | | | |
| CLASSIFICATION | CA | CA | | | | | | | |

A - Approved CA - Conditionally Approved R - Restricted
RND - Restricted/No Depuration P - Prohibited